

REMARKS

Following entry of the amendments enclosed herein, claims 1 and 3-13 are pending in the application, with claim 1 amended herein, claims 3-13 added herein, and claim 2 having been cancelled.

Support for the amendments to claim 1 is found in paragraph [0018] of the specification as filed. Support for new claims 3-13 appears in paragraph [0018] and [0019]. Entry of all amendments and reconsideration and allowance of all pending claims are courteously requested.

Claim Rejections - 35 U.S.C. § 101

Claim 2 stands rejected under 35 U.S.C. § 101. Claim 2 has been cancelled, and the rejection is moot.

Claim Rejections - 35 U.S.C. § 112, second paragraph

Claims 1 and 2, stand rejected for alleged indefiniteness under 35 U.S.C. § 112. The Office Action contends that the claims fail to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is moot for claim 2.

The Office Action objects to the phrase "introducing any carbonaceous, fuel; coal, coke, biomass or combinations thereof containing mercury", found in claim 1. The language in claim 1 has been amended herein to specify that the fuel is "a carbonaceous fuel that contains mercury".

The Office Action further objects to the phrase "introducing an alkali or any alkali or combinations thereof from the class consisting of lime, limestone, dolomite, calcium chloride, nacholite [*sic*], and trona". This language has been removed and the rejection is now moot.

The Office Action also objects to the limitation in claim 1, "at a stoichiometric air to oxygen air to fuel ratio of 0.4 to 0 0.80". This language has been amended herein as suggested to state, "air to fuel ratio". In addition, said ratio has been clearly identified as stoichiometric.

Claim 1 has also been rejected for alleged indefiniteness due to lack of clarity regarding whether the recited temperature is required. This language has been removed and the rejection is now moot.

Additionally, claim 1 has been rejected due to alleged lack of proper antecedent basis. The amendments herein remedied the alleged improper antecedence.

All of the rejections under 35 U.S.C. § 112, second paragraph, have been addressed and overcome by amendment, addition, or cancellation of claims. Withdrawal of these rejections and allowance of the claims are respectfully requested.

Claim Rejections - 35 U.S.C. § 102 (b)

The examiner has rejected Claim 1 under 35 U.S.C. § 102 (b), for alleged anticipation by U.S. Patent 1,571,877 by McElroy ("McElroy"). For a reference to anticipate a claim, the reference must include, either expressly or inherently, all of the limitations of the cited referenced. *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The Office Action alleges that McElroy disclosed a method comprised of introducing carbonaceous fuel into a first stage partial oxidation gasifier; and introducing lime with the said fuel or separately. In addition the Office Action alleges that although the reference does not explicitly disclose mercury being removed, as coal inherently comprises mercury, said mercury will inherently be removed by the process of McElroy.

McElroy does not explicitly or inherently disclose the element of firing the coal with the air in a stoichiometric ratio. In McElroy, the process utilized is a fixed bed type gasifier. Coal is fed into the gasifier from hopper (2) located on the top of the gasifier and air (6) is introduced through tuyeres located at the bottom of the gasifier. In a fixed bed gasifier process such as this, the introduced coal goes through four different zones as it moves downward through the vessel. The first zone is water evaporation, the second is pyrolysis, the third is gasification, and the fourth is combustion. The molten slag is produced in the combustion zone at the bottom of the gasifier, so any mercury in the coal that reached the combustion zone would react with free oxygen and liberate mercury from any CaHg that may have formed in the upper gasification zone as CaO and HgO, which would be blown up through the gasifier.

McElroy's gasification would not capture mercury up to the levels claimed in the present invention. The present invention fires the coal with the air to maintain a highly reducing condition in the molten slag under a controlled air: fuel sub-stoichiometric ratio. This method allows for a mercury capture of over 90% capture when operating at an air: fuel stoichiometric ratio (SR) of 0.60, down to 64% capture when operating at a stoichiometric ratio of 0.80. Under the same conditions, it is likely that the process claimed in McElroy would capture around 10% of the mercury.

As McElroy does not explicitly or inherently disclose the element of firing the coal with the air in a stoichiometric ratio, withdrawal of this rejection and allowance of the claims are respectfully requested.

CONCLUSION

Entry and reconsideration of all pending claims in this application are respectfully requested. In the event that a telephone conference would resolve any remaining issues with the application and lead to allowance, the Examiner is invited to contact the undersigned at the number given below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'M. L. Dever', with a long horizontal flourish extending to the right.

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